Sambus Geospatial Limited

NEWSLETTER

7th EDITION | SEPTEMBER, 2022.

GIS

FOREWORD

By Samuel Zoe

Geospatial technology is helping provide solutions to challenges across various industries and sectors. The Sambus newsletter provides a medium where these solutions are showcased, with an emphasis on how geospatial technologies are being used to solve local and global challenges.
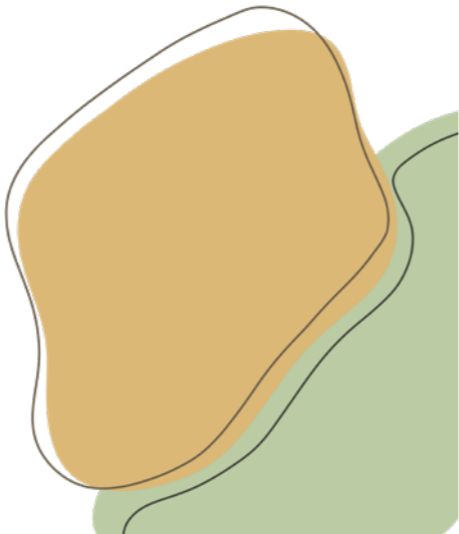
In this seventh edition of the Sambus Newsletter, we provide a special feature on how Eko Electricity Distribution Plc (EKDP) is using GIS to reduce electricity losses as part of their operations. It also features how construction drones are being used to streamline projects and how Artificial Intelligence (AI) is being employed by industries to automate processes, improve predictive modeling, and gain competitive advantage.

Sambus is strongly committed to working in collaboration with businesses and individuals to create, develop, and offer a completely customizable solution for the geospatial needs of organizations in West Africa.

Sambus appreciates your ongoing support and contributions to the Sambus Newsletter. We trust that our newsletter provides insight on how businesses can capitalize on the plethora of opportunities in geospatial technology.

Samuel Zoe

Samuel Zoe
Business Development Lead
Sambus Geospatial (Ghana)

ABOUT SAMBUS GEOSPATIAL

Sambus Geospatial is a technology integration firm that provides a range of geospatial solutions to different industries. With over 33 years of operational experience, our corporate alliance with geospatial giants; Esri, Trimble, L3Harris, and Wingtra Drones, has given us the edge in the implementation of location intelligence solutions to support and empower seamless workflow and informed decision making in every organization.

Sambus Geospatial Offices

Sambus Geospatial operates in Ghana, Nigeria, Liberia, Gambia, Gabon, Sierra Leone, and Equatorial Guinea, with operational offices in Ghana and Nigeria. We are also supported by resellers and partners across our operational regions. Operating with a compelling urge to empower the needs of Africa using State-of-the art geographical standard technology,

Sambus Geospatial remains the most preferred mapping and geospatial solution provider in West Africa. The organization has qualified staff who develop and deploy tailor-made solutions for all our clients to gain optimum benefit and satisfaction.

Vision statement

To be the preferred geospatial innovator in West Africa.

Mission statement

To become a distinguished organization in the application and advancement of geospatial knowledge and technology for effective planning, operations and enhanced decision making in West Africa.

Core Values

Trust (T): Every business transaction is implicitly a relationship of trust as parties to any transaction have the assurance that they will receive value from the engagement. Trust is the starting point for Sambus with confidence in our staff to deliver value to our stakeholders as we trust that our stakeholders will do the same.

Service (S): Sambus does not just sell, we serve. We serve our clients and stakeholders and support them in reaching their objectives. There is an intrinsic reward in being of service to another, and we live by that at Sambus. We want all our stakeholders, from staff to business partners and clients to remain loyal to the Sambus brand, and it is through quality service that we achieve that.

Integrity (I): Integrity and honesty go side by side, and as a company that embraces openness, we uphold integrity and being morally upright in all our operations and business transactions.

Respect (R): Organisations are made of people, and every person is unique and special regardless of their rank and status in life. Respect for people is an integral part of the Sambus culture and it is our hope that this is reciprocated by all our stakeholders.

Honesty (H): Honesty and transparency in dealings and transactions are what we stand by and expect from all stakeholders.

Commitment (C): An unwavering commitment to delivering added value to our stakeholders and being innovative about the provision of solutions to clients. All our stakeholders are expected to reciprocate the same commitment offered them.
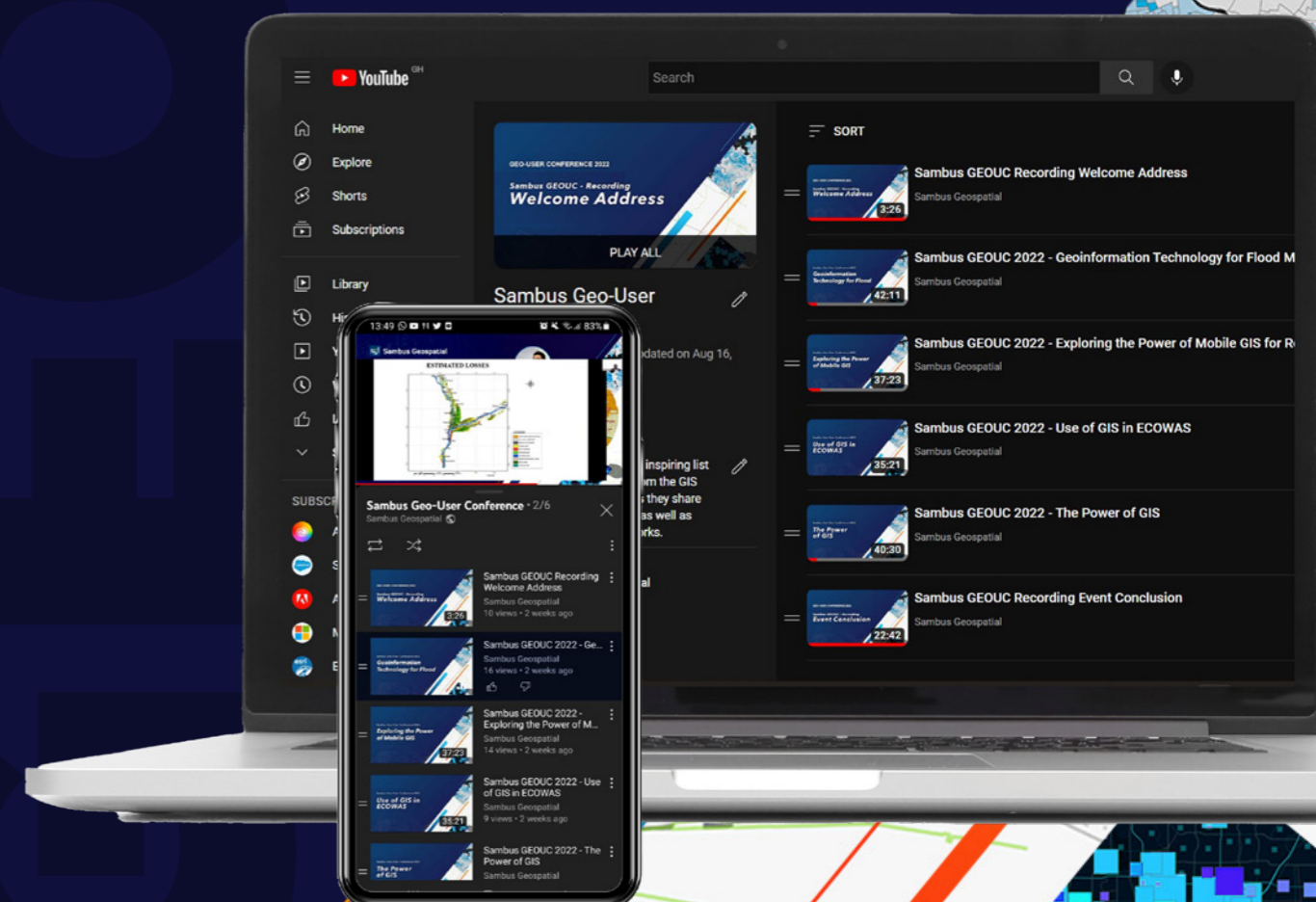
![Sambus Geospatial logo]

Sambus Geo-User conference 2022

WATCH THE RECORDED SESSIONS

See inspiring presentations and demos on new spatial workflows used in a variety of industries.

Visit bit.ly/GEOUCplaylist

#GeoUC

Eko Electricity Distribution Reduces Losses with GIS

Damilare Ojo, GIS Project Lead, EKEDP, Nigeria.

The Nigeria power sector has been evolving steadily since 2005. Until then, only one company provided generation, transmission, and distribution of electricity to the entire nation. Unbundled into the three sectors are 11 electricity distribution companies (DISCOs), of which Eko Electricity Distribution Plc. (EKEDP) is one. In 2013, EKEDP was privatized, and it covers the license area of the Eko zone, a densely populated area that consists of the southern part of Lagos state and Agbara in Ogun state. It serves over 600,000 commercial and residential customers.

Challenge

One of the major challenges that EKEDP faced after being privatized was the absence of good data. The company lacked accurate records of its electrical assets and locations. Another difficult challenge was the scarcity of quality data about customers' electricity consumption, which created operational difficulties. However, the company most significant challenge was reducing its Aggregate Technical, Commercial, and Collection (ATC&C) losses. In 2015, it only accounted for 65 percent of the energy delivered from its electrical substations.

There are three components of those losses. The first is technical or heating loss, which was higher than expected at EKEDP. Lack of good network information made it impossible to track down the source of excessive technical losses. The second is commercial loss, which involves the inaccuracy in the measurement of a customer usage. The practice for years was to estimate energy use. Since data was insufficient, estimated use (and thus bills) was often wrong, resulting in significant customer dissatisfaction. In addition, old mechanical meters were inaccurate, and many customers

did not even have meters. The third is collection loss, consisting of two factors. First, whether the electric bill was accurate or not, many of EKEDP's customers did not pay their bills. Secondly, other customers who had meters tampered with them, resulting in the theft of energy.

Solution

EKEDP has set an aggressive goal of dropping its losses from a high of 35 percent to under 10 percent over the next half a decade. Since privatization, EKEDP has made substantial strides by implementing data decision-making tools, one of them being a modern geographic information system (GIS). It formed the foundation to improve all three losses. Since the company did not have accurate paper records and maps, staff had to create them from scratch using Esri's ArcGIS Collector and ArcGIS Survey123.

▶ *Dashboard – Progress of Distribution Transformer Validation*

The company then leveraged Schneider Electric's ArcFM built on ArcGIS to edit and manage its data. ArcGIS Dashboard was used to monitor staff progress in the data collection processes. They later migrated to Esri's ArcGIS Field Maps for their field data collection.

Technical Losses Identified.

With this framework, the company crafted a project to aggressively lower its losses. Staff analyzed the electrical network to uncover likely areas of excessive technical losses. They discovered sections of cables that were undersized. With the aid of ArcGIS, they carried out a comprehensive feeder route length analysis that enabled the company to attain optimal routing of its overhead network lines and underground cables within the shortest physical distance and at minimal cost. Overloaded transformers, which created excessive heat, were also uncovered and later relieved. Location technology and solid data collection practices helped pinpoint likely culprits.

Attacking Commercial Losses.

The long-term solution for all customers is smart meters, whether they are pre- or postpaid meters. However, as in most parts of the world, this will take substantial resources. In the shorter term, EKEDP implemented an innovative approach to improve the processes. The field marketers' practice was to measure the energy supplied by the transformers and manually allocate the energy to the individual customers. However, since some customers either had prepaid meters, no meters, or old and inaccurate meters, the field marketers needed better data. In addition, before GIS, transformers were moved from one location to another. Therefore, the relationship of the customer to the transformer was unclear, so the allocation of energy to an individual customer was time-consuming and inaccurate. Calling on Esri's field solutions, the field marketers collected the correct transformer and meter


▶ GIS Map of EKEDP Electrical Assets

information. This data was then included in their GIS, which resulted in significantly improved billing accuracy.

Managing Collection Losses.

Customers do not pay their electric bills for a variety of reasons. Some either cannot afford to pay, feel that electricity should be provided by the government, or are upset about incorrect bills and refuse to pay. Getting accurate bills to customers builds trust, and EKEDP's project is intended to build that trust by assuring that customers get correct bills. GIS can also help to identify areas of extreme poverty where customers cannot pay and for siting of cash offices in strategic locations for collection optimization. Without these analytics, the company would be in the dark about its collection issues. The company also used GIS to pinpoint areas of sudden drop in consumption. As a result, it can better manage resources

to send investigators to areas of suspected energy theft.

Results

By creating a comprehensive GIS and implementing innovative analytics, EKEDP is steadily reducing its losses. Losses now have been reduced by 5 percent, even during the COVID-19 pandemic when collection losses skyrocketed. With EKEDP's now accurate GIS, marketers (Eko Field Representatives) with the collector/field map application track all the distribution transformer assets in each feeder starting from the source of the feeder at the substation to the termination point. Then all the distribution transformers were matched correctly with their respective meter assets for a proper energy audit. With GIS, EKEDP will now have the data infrastructure to tackle its grid modernization efforts, including a complete rollout of smart meters.
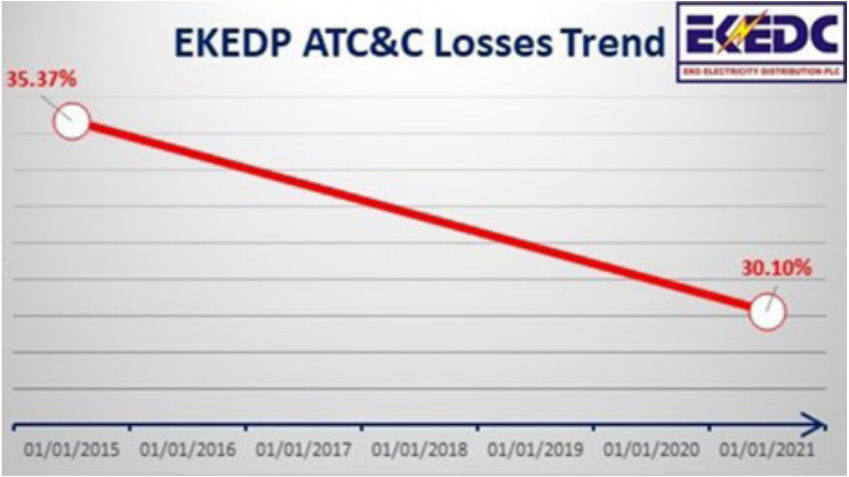

▶ *Despite COVID-19 Collection Challenges, Losses Decreasing* "The GIS made it possible to account for the energy distributed and consumed, ensuring accurate billing [for our customers and] increasing our billing efficiency, which resulted in increased collection. GIS also helped us discover cases of burnt meters and energy theft."

ArcGIS Workforce

Smarter field workforce coordination at your fingertips
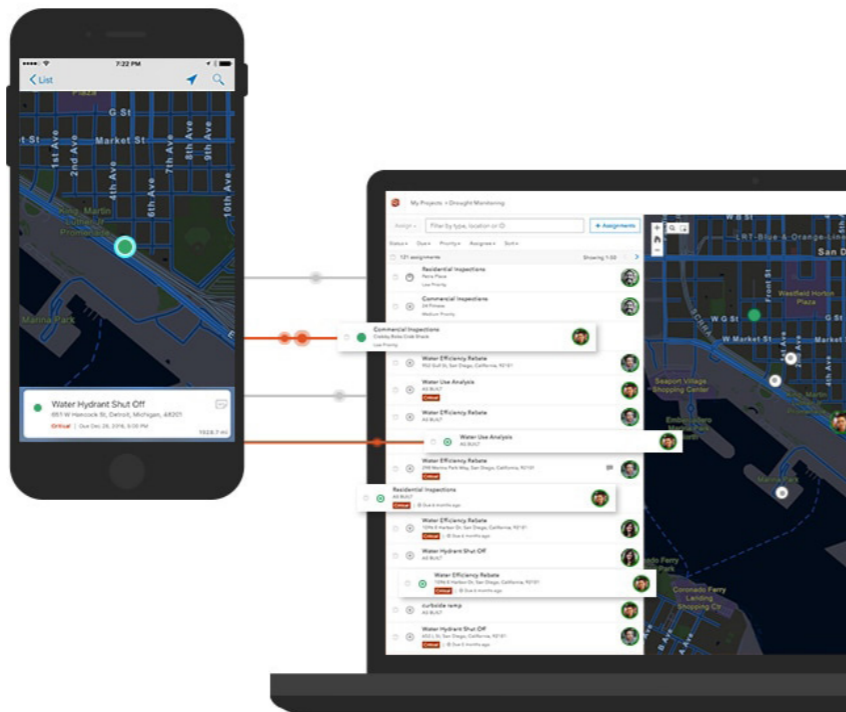
Create Assignments

Dispatchers use a web app to create assignments and send them to mobile workers while also tracking the location of workers in real time.

Work in the Field

Mobile workers use an app to complete To Do lists and get work assignments on their mobile devices. Dispatchers get progress updates.
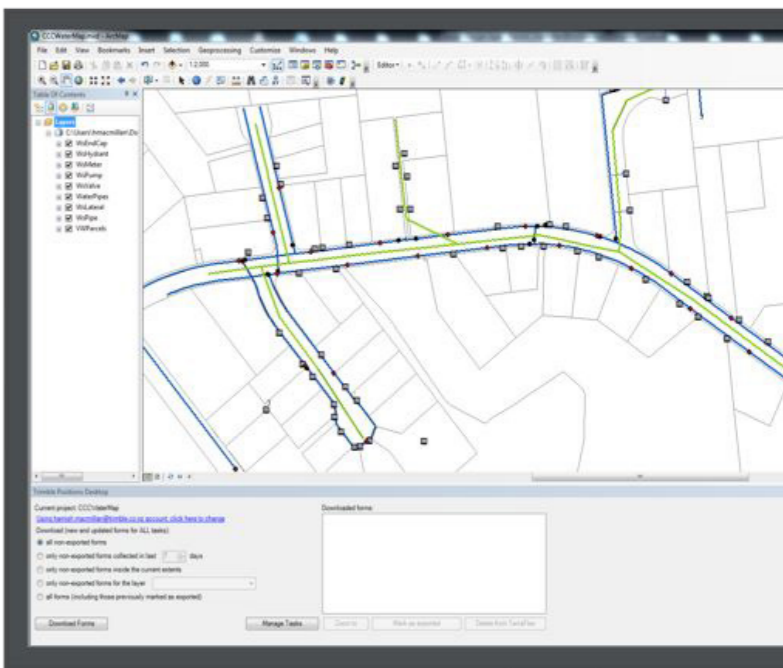
Create a Project

Dispatchers and miobile workers use the same Workforce project, created by Project Owner. It defines the work type and worker roles.

Workforce is fully integrated with ArcGIS

Combined with other ArcGIS apps, you can maximize efficiency in your field workforce and get the flexibility you need to run in the cloud or in your own IT infrastructure.
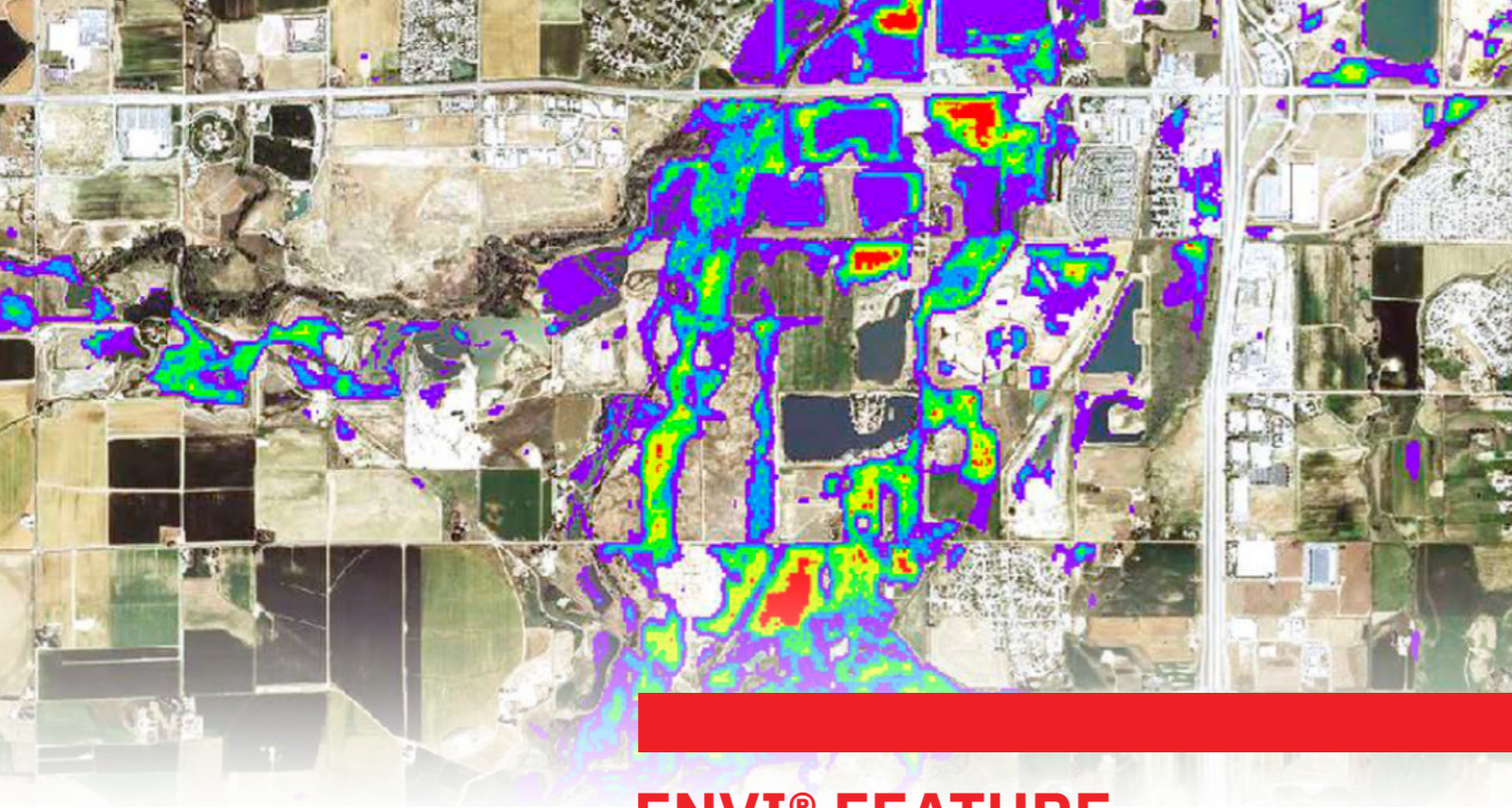
THE SCIENCE OF WHERE

TerraFlex and Esri

Direct Esri Integration

Integrate directly with your Esri® geodatabase to streamline field data collection for greater productivity and efficiency.

DIRECT INTEGRATION WITH ESRI

Integrate directly with your Esri geodatabase to streamline field data collection for greater productivity and efficiency. The TerraFlex add-in for ArcMap® enables you to create projects straight from your Esri geodatabase and download collected data directly back into it. There are no import and export processes to manage which means you benefit from higher data quality and greater productivity.

Next Gen Productivity

®Trimble.

ENVI® FEATURE EXTRACTION MODULE

FIND FEATURES IN YOUR GEOSPATIAL IMAGERY QUICKLY AND EASILY

Benefits

Modern technology

Quick and easy workflows

Accurate results

Finding objects in an image scene, (feature extraction), is a very useful capability in geospatial imagery workflows. Previous processes for extracting features from an image were complex and time consuming. Now, L3Harris Geospatial provides a technologically advanced approach to feature extraction that saves time and effort, while providing the accurate results you need.

Feature extraction has a variety of practical applications, allowing you to isolate only the objects you're interested in, like roads, coastlines, buildings, and vehicles.

The ENVI Feature Extraction Module (ENVI FX) allows you to quickly and easily extract features from high-resolution imagery. ENVI FX walks you through the extraction process from image ingest to the export of results, and allows you to extract the
features you need. Rapid rendering preview screens readily allow for adjustments at any point in the workflow. And, ENVI FX is built with a high performance image processing engine to deliver fast results, even with large datasets.
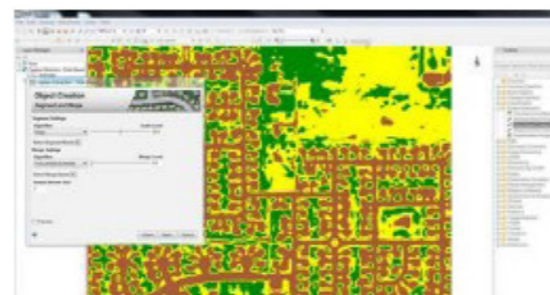
An intuitive dialog box at the beginning of the ENVI FX workflow prompts you to import a base image, ancillary data, and a mask file.

Visit l3harrisgeospatial.com

L3HARRIS™
FAST. FORWARD.

STREAMLINING FUTURE PROJECTS WITH CONSTRUCTION DRONES

Drones! You've heard about them and seen them all over the place. Drones provide endless possibilities and applications, whether flying around a room or shooting unusual aerial footage even in the field of construction. The drone industry is rapidly expanding, and the technology offered by drones is virtually endless. They are being employed in a wide range of commercial applications, including filming for television, real estate, package delivery, weddings, and 3D mapping.

According to a McKinsey & Company report, the construction industry is ripe for disruption, since building projects are taking longer than necessary and are currently running 80 percent over budget. Since the 1990s, this has resulted in a decrease in several markets around the world, with financial returns on investments for contractors being poor and volatile.

Drones in construction aren't new, but they're being adopted at a higher rate than ever before by construction companies. Drone usage has increased by 239% year on year, outpacing that of any other business sector (DroneDeploy, 2018). They are a useful tool because of their aerial vantage point and data collection capabilities, which provide benefits ranging from on-site safety to remote monitoring. The capabilities of drone technology have revolutionized the entire project life cycle, from conception to completion. Drones have shown to be essential in the field, whether they are employed to conduct land surveys or to follow equipment.

Construction Drones are outfitted with a variety of functions to aid in the collection of critical data on construction sites, such as cameras, GPS units, temperature sensors, and infrared sensors. The data they collect can be transmitted to a computer via drone software, allowing users to evaluate, interpret, and arrange the data. These features increase project management efficiency and allow for more thorough inspections. Drones can boost efficiency, save expenses, and streamline workflow due to their real-time data capturing and unique aerial advantage.

The ability to acquire exact visual data of a site faster and cheaper than using terrestrial techniques or manned aircrafts is the first and obvious benefit of drones in the construction sector. But that's only one of the many advantages drones can provide to construction firms. Below are a few instances of how drones are employed in the construction industry.

Topographic Mapping and Land Surveys.

When planning complex large-scale building projects, topographic maps become very essential. They can uncover costly flaws in designs that aren't suited to specific terrain. Although topographic maps are useful, they are costly and time-consuming to create. As a result, maps are not always updated at the start of a project. Drones can significantly reduce the time required visualizing a site's topography due to their capacity to map large areas of land. This aids in keeping the project on track and within budget, as well as ensuring accuracy before it commences. This data can be used to determine feasibility and assist with design. Additionally, the high-resolution photographs obtained by drones may be turned into 3D models, allowing the construction crew to pinpoint issues during pre-construction and spot scope errors, hence saving time and money.

Tracking of Equipment.

Losing track of where equipment is situated at each job site is an issue that practically every project manager encounters. With the use of a drone, managers can make flyovers and instantly assess equipment and where they should be. They can also swiftly detect whether a piece of equipment that should be terminated is still on-site, avoiding costly extension fees. Equipment malfunctions are another common issue. Drones' recording functionality could be used to identify issues remotely and provide visual representations that aid in communicating those issues. Operators can easily send recorded data to repair technicians at equipment rental companies for quicker and more accurate diagnostics before they even make it to the worksite.

Remote Monitoring and Progress Reports.

Another advantage of construction drones is the increased visibility they may provide to clients. Drones can create stunning aerial views and provide clients with a better understanding of the project's progress, especially when they are unable to physically visit the site. This gives them peace of mind that their money is being spent wisely. Drones can improve internal team collaboration by transmitting information to connected software during flyovers, in addition to client communications. Design teams, engineers, construction managers, employees, and owners can all view the data at the same time to track the project and spot any errors. Drones can also leave a trail of documents that can be accessed later by teams.

Security Surveillance.

Having equipment stolen from a job site can be damaging at times. Losing tens of thousands of dollars dues to stolen boom lift or excavator can lead to breakdown of projects. Every year, over $300 million worth of construction equipment is stolen from job sites, according to the National Equipment Register, with fewer than 25% of it being recovered. As a result, equipment security is a critical aspect of task management. A drone operator can perform a flyover to swiftly determine whether a piece of equipment is in a safe area. They can also use the security camera to see if there are any unauthorized people on the premises. This can aid in the prevention of damage or theft, as well as the identification of any trespassers.

Personnel Safety.

Most construction companies place a high priority on worker safety. Worker fatalities are primarily caused by falls, which account for 34% of all fatalities. When collecting manual measures, workers are frequently required to climb to unstable platforms and negotiate around dangerous conditions. Drones can take the place of workers in certain scenarios, reducing the risk to construction workers on the job. Most construction companies place a high priority on worker safety. Worker fatalities are primarily caused by falls, which account for 34% of all fatalities. When taking manual measurements, workers are frequently required to climb to unstable platforms and navigate around dangerous conditions. Drones can take the place of workers in certain scenarios, reducing the risk to construction workers on the job.

Conclusion.

Drones are currently being deployed on building projects all around the world, especially in Africa. The Gauteng Department of Infrastructure Development has begun utilizing drones to monitor the construction site of the Phillip Moyo Community Health Centre (KH Plant, 2021). The drone was being deployed to collect data on the construction delay, which was expected to last 8 months. This data was used to discover inefficiencies and determine the cause of the delay to avoid further delays and even to streamline future construction projects. According to Marius Hough, the director of operations at Dronezone in South Africa, African Construction firms can benefit in a big way from drones. "Drone technology can be used in a variety of applications around building sites, from the monitoring of progress to inspections, to security patrols, to delivery of small key items," he said.

INTEGRATING AI INTO GIS TECHNOLOGIES

Artificial intelligence (AI) has advanced rapidly, equal or even surpassing human accuracy in tasks such as image recognition, reading comprehension, and text translation in recent years. In broad terms, AI refers to a computer's capacity to accomplish a task that normally needs some level of human intellect. Machine learning is one type of engine that makes this possible. It learns from data using data-driven algorithms to provide you with the answers you require. Deep learning is a new type of machine learning that uses computer-generated neural networks that are inspired by and resemble the human brain to solve problems and make predictions. The convergence of AI and GIS is opening up previously unimaginable possibilities. AI GIS is a phrase that refers to a group of technologies that combine artificial intelligence (AI) with GIS operations such as

spatial data processing and analysis algorithms (Geo-AI). AI GIS has progressively been the major focus of geoscience research and application in recent years.

> " AI GIS technology is divided into three components (GEOAI, AI for GIS and GIS for AI), often known as the trilogy of AI GIS (Super Map, 2020).

GeoAI is a spatial data processing and analysis algorithm that integrates AI. GeoAI is divided into two parts: geospatial machine learning and geospatial deep learning. Using Geospatial Machine Learning in ArcGIS, users may tackle a number of GIS application challenges such as geographical clustering, spatial classification, and spatial regression. The Geospatial Deep Learning algorithms in ArcGIS, for example,

include 3D data analysis and image analysis. AI for GIS on the other hand refers to the application of artificial intelligence (AI) to improve the intelligence of GIS such as AI attribute collection, AI survey and mapping, AI cartography, and AI interaction. GIS for AI is when GIS empowers AI by using its geographical visualization and spatial analytic capabilities to further process and mine data when confronted with AI recognition findings. Traffic flow monitoring, city component management, are examples of map visualization applications that can provide decision makers with a more intuitive form of information expression, while in-depth processing and mining of AI extraction results can enable real-time geo-fence alerts, vehicle tracking, and other applications. The most competitive firms are investing strategically in artificial intelligence (AI),

particularly machine learning, and using location data as a connecting thread to automate processes, improve predictive modeling, and gain competitive advantages. Location analytics is already being used by these prominent companies to find hidden trends, get critical insights, and gain a competitive advantage. AI systems are used by manufacturers to improve supply chain logistics, automate inspections and quality control, schedule predictive maintenance, and identify any unexpected activities before they delay production. To keep one step ahead, operations managers, route planners, and drivers utilize artificial intelligence (AI) to fill in gaps in road network databases, track assets in real time, properly estimate arrival times, and anticipate future supply demands.

In an interview, Liezel Botha, the Geospatial Technology Lead at Esri South Africa, discussed the key uses of Geo AI in South Africa, which include image analysis for change detection. He went on to explain that Geo AI makes rapid change detection analysis possible which in turn aids effective and timely decision making. Backyard buildings, rooftop solar panels, and cases of land encroachment on electrical servitudes are all examples of applications in South Africa.

The study of sales and telemetry data, site selection for new enterprises, and the verification of fire or flood insurance claims are all commercial applications of Geo AI in South Africa. Using AI GIS to better develop the next generation of GIS technology systems is a viable solution to the GIS system's existing intelligence challenge. Additionally, AI technologies like speech recognition and language processing can be integrated, allowing GIS operations to be more empowered.

GEOSPATIAL

UPCOMING
EVENTS 2022

OCT 31

Geo Week 2022
This is your time. Come connect with the Trimble community and discover the ideas that will fuel tomorrow's innovation.

Sambus Partner Workshop
Hosting our first in-pershon workshop for all partners to learn new ways of maximizing your partnership with us.

09 NOV

World GIS Day
Participate in the international celebration of GIS technology. It's a chance for you to share your accomplishments and inspire others to discover and use GIS.
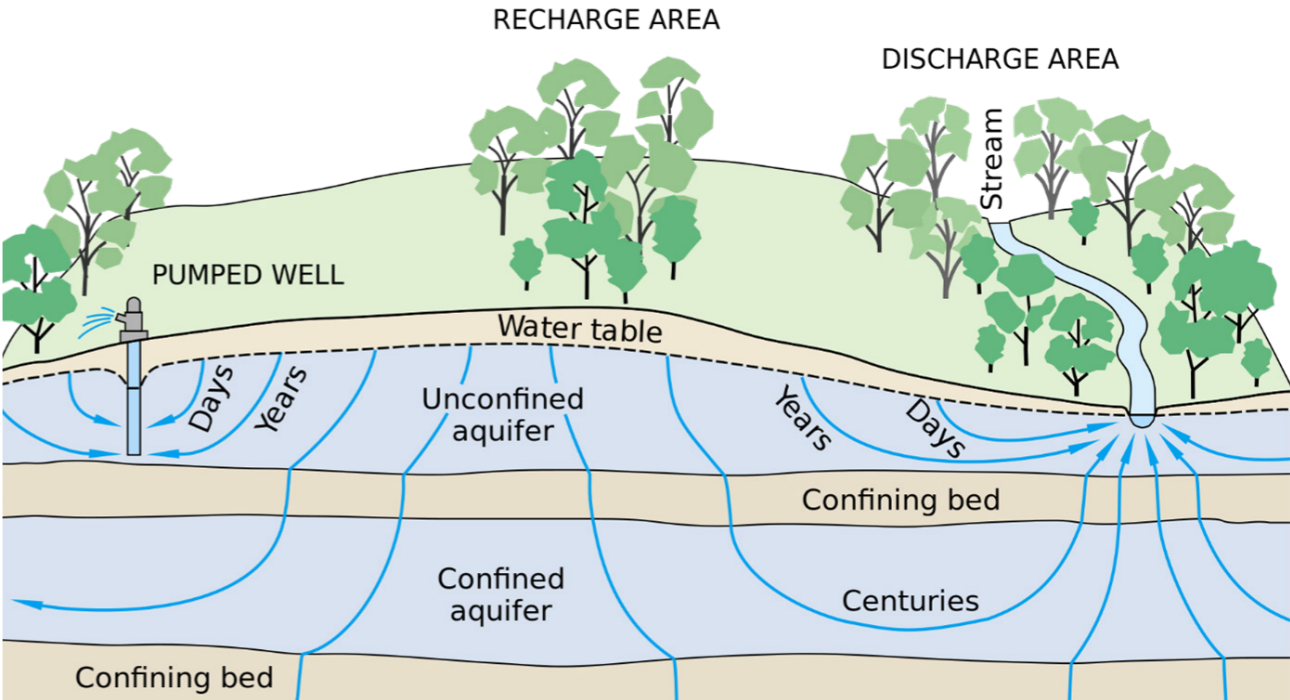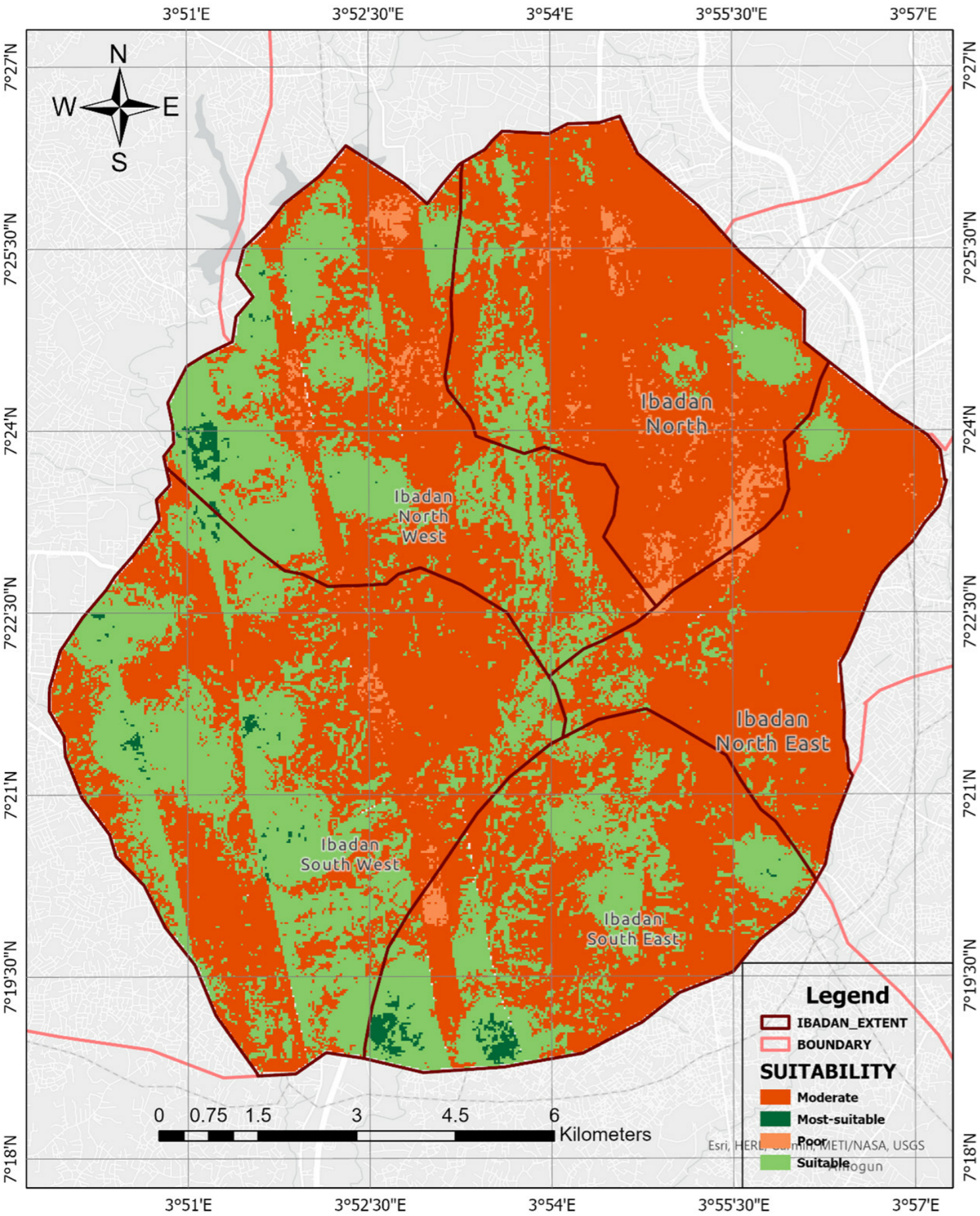
16 NOV

FEATURE IN OUR NEXT NEWSLETTER

Don't miss out on our next newsletter.
Get in touch with marketing@sambusgeospatial.com
to feature your projects and articles.

**For More Information,
Contact marketing@sambusgeospatial.com**

MAP
GALLERY

SEE THE BEST MAPS DEVELOPED BY
GIS PROFESSIONALS FOR VARIOUS
INDUSTRIES

GROUNDWATER POTENTIAL MAP OF IBADAN METROPOLIS

Legend

IBADAN_EXTENT
BOUNDARY

SUITABILITY
- Moderate
- Most-suitable
- Poor
- Suitable

RECHARGE AREA

DISCHARGE AREA
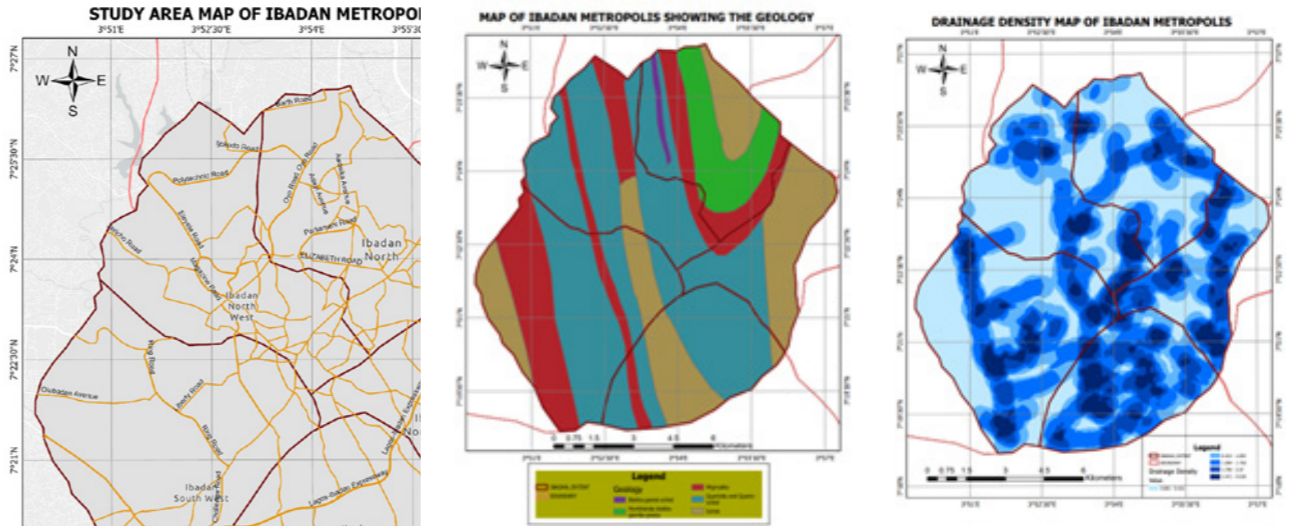
GROUND WATER POTENTIAL MAPPING OF IBADAN METROPOLIS USING GEOSPATIAL TECHNOLOGY

This study uses Geographical Information System (GIS) techniques to map the groundwater potential areas within Ibadan metropolis using the Multi-Criteria Decision Analysis. Ibadan is a basement complex in Western Nigeria and is predominantly made up of banded gneiss with hornblende-biotite-rich bands alternating with quartz-oligoclase-rich bands. Large lenses of granite gneiss and thin intercalated layers of quartzite and amphibolite make up the banded gneiss, which formed as part of a sedimentary succession. By examining the variables that affect groundwater resources in Ibadan metropolis, remote sensing and GIS techniques were employed to assess the groundwater potential of the region. The study proved how GIS could handle enormous amounts of data of various types.

Contact
Benedict Mberede
bmberede@sambusgeospatial.com

Software
ArcGIS PRO

ANALYSIS OF VEGETATION IN IBAJI LGA USING SOIL ADJUSTED VEGETATION INDEX

The Soil Adjusted Vegetation Index (SAVI) is one of the spectral indices used to perform analysis and interpretation, especially for vegetation analysis. The brightness and shade of vegetation canopies, as well as the brightness of the soil background, are background elements that significantly affect the Normalized Difference Vegetation Index (NDVI). Studies have demonstrated that the NDVI rises steadily as the background brightness rises. Due to the influence of the soil background, radiation increases greatly when the vegetation cover is low, while near-infrared (NIR) radiation decreases to better understand the interaction between vegetation and the soil. To account for the soil effect, numerous vegetation indices have been created. The SAVI model of a soil vegetation system was created to improve NDVI (which is used to measure the greenness, density, and health of vegetation in each pixel of a satellite, also often known as the "greenness index.") sensitivity to soil backgrounds. " The Soil-Adjusted Vegetation Index (SAVI) is a vegetation index that employs a soil-brightness correction factor to reduce the effects of soil brightness. This project used the SAVI model on vegetation in the Ibaji Local Government Areas (LGA). Ibaji Local Government Area is a local government in Kogi State, Nigeria, known for its intense agricultural practices. It falls in the southern part of the state. It shares a border with Delta State in the south and is separated from Edo State to the west by the Niger River. The Ibaji LGA's economy heavily relies on agriculture, with the region famous for producing products such as rice, yams, corn, potatoes, cassava, and vegetables. Fishing and trading are two other significant economic activities carried out by the residents of Ibaji LGA.

METHODOLOGY

Landsat 8 imagery was downloaded from the https://earthexplorer.usgs.gov/. The resolutions contained in the file ranges from 15m (panchromatic), 30m (Visible-SWIR) and 90m (Thermal IR) resolutions. The Near Infrared, Red and Green band were combined to make a false colour-composite (543) to enhance vegetation in the NIR region. Also, NIR band(band5) and the Red band(band 4) were inputed into the Raster calculation toolbox to calculate the Soil Adjusted Vegetation Index using the formula:

$$SAVI = \frac{(1 + L)(NIR - Red)}{(NIR + Red + L)}$$

COMPOSITE MAP OF IBAJI LOCAL GOVERNMENT AREA, KOGI STATE
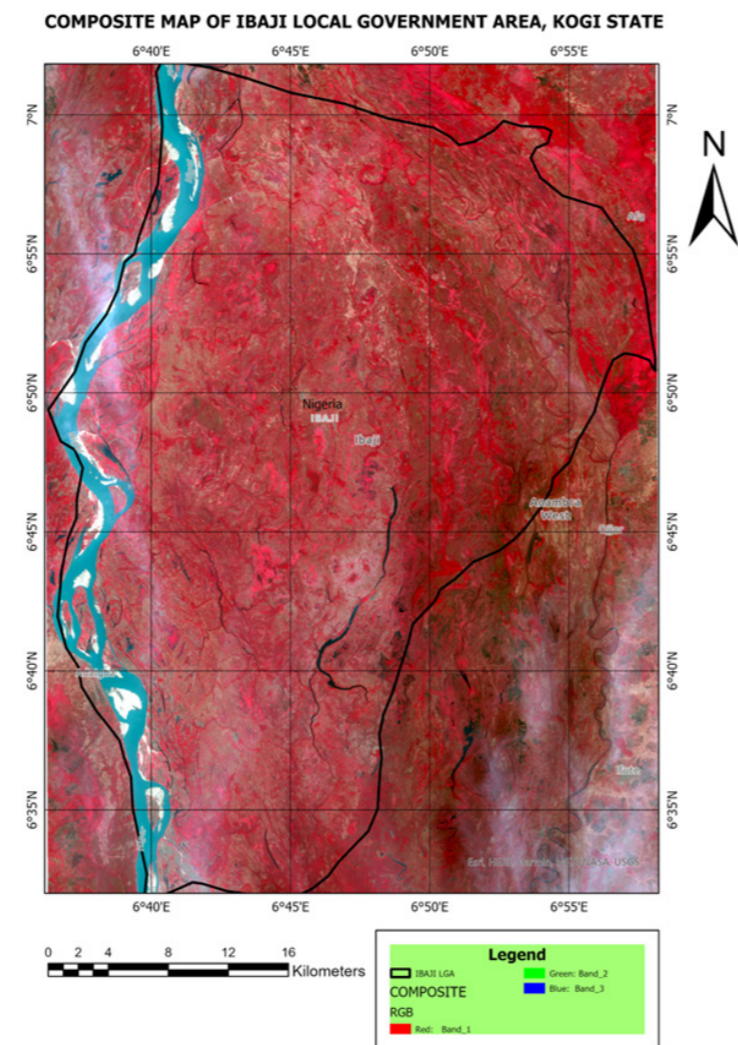
Bands	Wavelength (micrometers)	Resolution (meters)
Band 1 – Coastal aerosol	0.43-0.45	30
Band 2 – Blue	0.45-0.51	30
Band 3 – Green	0.53-0.59	30
Band 4 – Red	0.64-0.67	30
Band 5 – Near Infrared (NIR)	0.85-0.88	30
Band 6 – SWIR 1	1.57-1.65	30
Band 7 – SWIR 2	2.11-2.29	30
Band 8 – Panchromatic	0.50-0.68	15
Band 9 – Cirrus	1.36-1.38	30
Band 10 – Thermal Infrared (TIRS) 1	10.6-11.19	100
Band 11 – Thermal Infrared (TIRS) 2	11.50-12.51	100

SOIL ADJUSTED VEGETATION INDEX MAP OF IBAJI LOCAL GOVERNMENT AREA, KOGI STATE
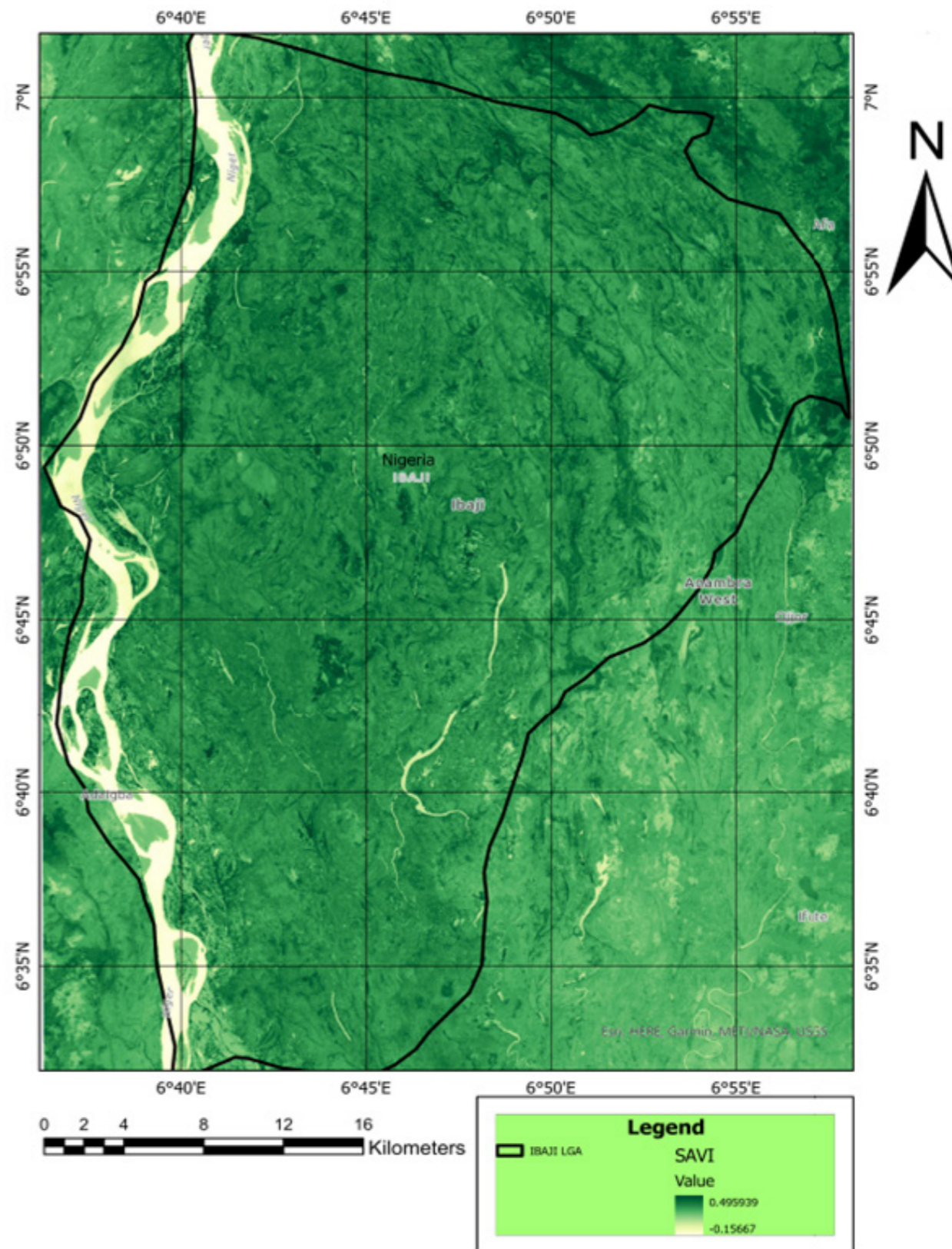
Contact
Benedict Mberede
bmberede@sambusgeospatial.com

Software
ArcGIS PRO

INUNDATION MAP OF THE PWALUGU DAM

INUNDATION MAP OF THE PWALUGU AREA USING DIGITAL ELEVATION MODEL

The Bagre Dam spillover causes perennial flooding in Pwalugu and its environs. When these floods hit, farms and other properties are destroyed. The Volta River Authority has begun engagement for the construction of a multi-purpose dam to hold the water discharged from the Bagre Dam.

This study uses ArcGIS Pro to showcase areas that would be inundated when water levels of the newly constructed dam is high and spilled.

Satellite image was obtained from Google Earth. Due to the unavailability of contours on the satellite image, a digital elevation data of the area was created. This elevation data was imported into ArcGIS Pro to create a Digital Elevation Model (DEM). Three elevation levels were selected, i.e., 146m, 148m and 150m to be the levels at which the dam will be spilled. This implied that all features at or below 150m were at risk if the water levels of the dam reached its maximum height.

After the level selection, the Less than geoprocessing tool in ArcGIS Pro was used to model the areas that would be flooded as well as the areas that the water would be inundated using the DEM.
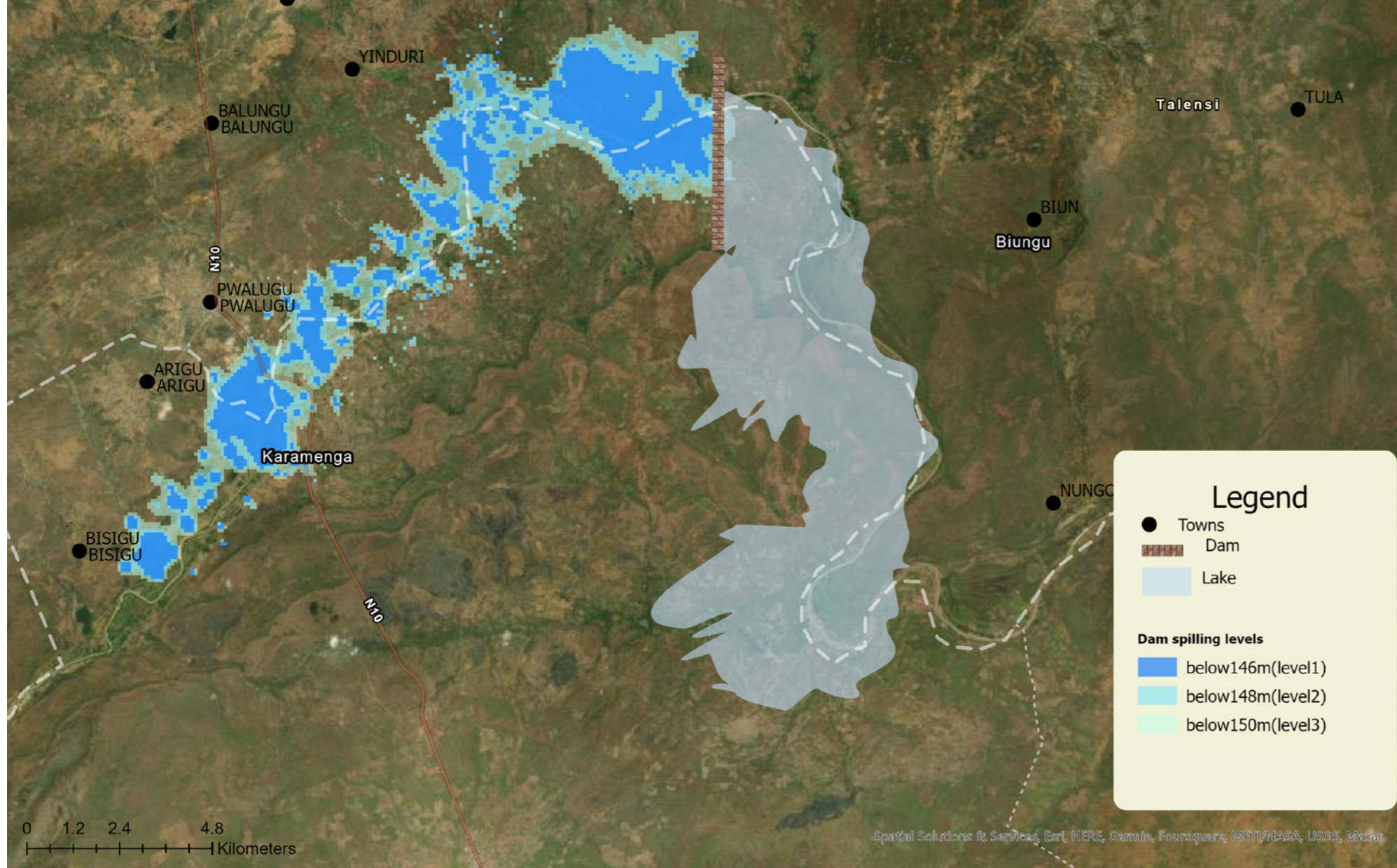
Information from maps showcases farms and other properties that will be affected during spillage. It further provides insight on resettlement and compensation plans for the affected communities.
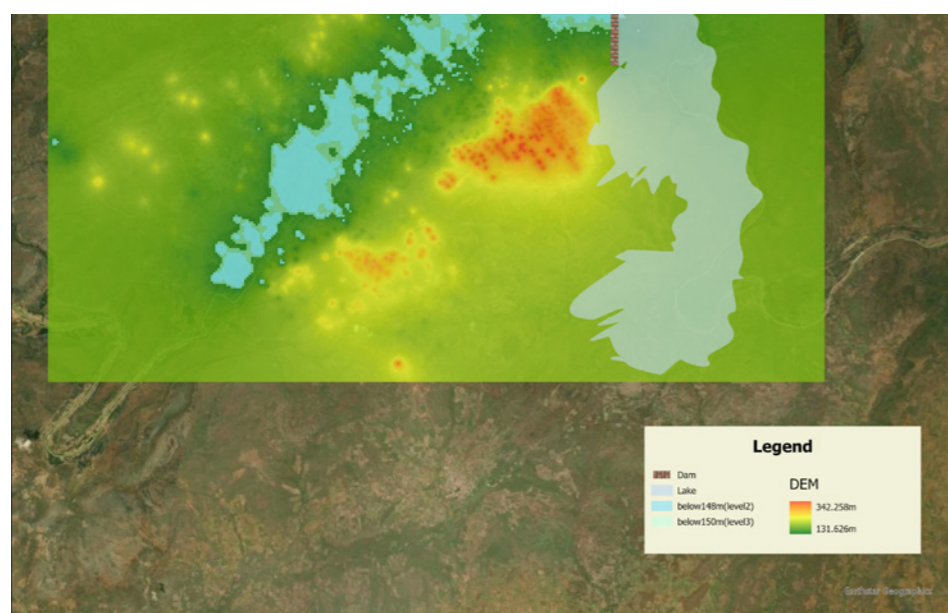
Contact
Kwabena Denteh
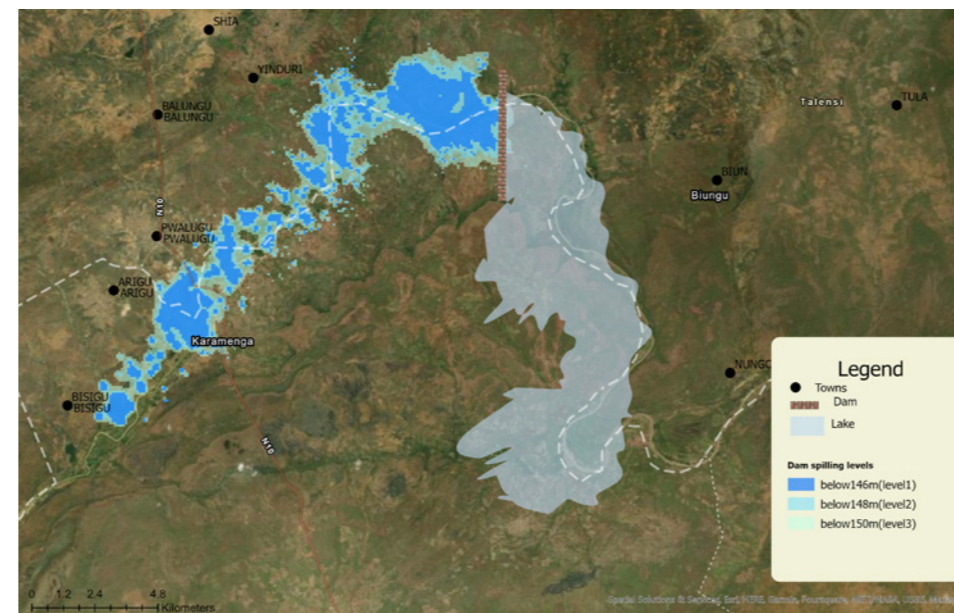kdenteh@sambusgeospatial.com

Software
ArcGIS PRO

DEM MAP OF THE PWALUGU AREA

INUNDATION MAP OF THE PWALUGU DAM

![Sambus Geospatial logo](sgl Sambus Geospatial)

Get In Touch

Sambus Geospatial (Ghana)
F702/1 Salem Street, Kuku Hill, Osu
P.O.Box, AN 16701, Accra North, Ghana
Telephone +233 (0) 302 777 127

Sambus Geospatial (Nigeria)
No. 19 Ebitu Ukiwe Street, Jabi
Abuja, Nigeria
Telephone +234 (0) 9 292 2821

Interact with Sales,
Email: info@sambusgeospatial.com
Visit: www.sambusgeospatial.com

Follow us on Social Media

 @sambusgis | @SambusGeoNigLtd

 @sambusgis | @sambusnigeria

 @sambusgeospatial | @sambusgeospatialnigeria

 @sambusgis | @sambusnigeria

Sambus Geospatial is a company that integrates technology and offers a variety of geo-spatial solutions to various sectors. Our corporate alliance with geospatial juggernauts Esri, Trimble, L3Harris, and Wingtra Drones, along with our more than 33 years of operational experience, has given us the upper hand in the implementation of location intelligence solutions to support and empower seamless workflow and informed decision making in every organization.

Global Alliances

esri Official Distributor | Trimble. Authorized Distribution Partner | L3HARRIS AUTHORIZED ENVI DISTRIBUTOR | wingtra